

CLIP SYSTEM FOR HOLDING VISE PARALLELS

BACKGROUND OF THE INVENTION

The present invention relates to the positioning of a workpiece in a vise for machining, and more particularly to an improved clip system for holding parallel plates against respective jaws of the vise in proper position to mount the workpiece during machining.

A vise is commonly used to secure a workpiece intended to be machined. Typically, the workpiece is mounted within the opposite jaws of the vise and secured in proper position therebetween using a pair of flat, metal plates known as parallels. These parallels, which may be of varying widths and thicknesses, are mounted immediately adjacent to the respective jaws in substantially identical positions on either side of the vise so that their upper margins act as reference surfaces for the mounting of the workpiece between the vise jaws. The parallels thus serve to mount the workpiece in an exact attitude while machining and it is essential that the parallels be held securely in place against the jaws in order for the workpiece to be machined correctly.

In the past, a number of different devices have been used to hold the parallels against the jaw surfaces. For instance, spring members have been inserted in the space between the parallels in pressing engagement with the parallels themselves with the springs being under compression. While these spring members have effectively served to position the parallels pressed against the vise jaws they can become easily dislodged under working conditions and hurdle through space, risking bodily injury to a workman adjacent to the workpiece. Other, more elaborate systems have been used

1 but these have been expensive to produce and complex to use, and they
require considerable amount of space for use in holding the parallels in
place. Some of these more elaborate prior art holding systems have required
substantial modifications to the standard jaws of a machine vise in order to
5 implement their use and operation, and in many cases, the costs and effort to
adapt those holding systems to existing vises has been burdensome.
Furthermore, most of these existing systems have been devised and
developed for disposition and operation within the spatial confines between
the opposed vise jaws. As a result, these existing holding systems may
10 sometimes interfere with the positioning of the workpiece between the jaws
and disrupt its proper attitude for machining. A need therefore exists for an
improved parallel holding system that works safely and effectively without
interfering with the position of the workpiece while machining, and that can
easily adapt to existing machine vises.

SUMMARY OF THE INVENTION

Accordingly, it is a general purpose and object of the present invention to provide an improved system for holding parallels properly in place against the jaws of a vise.

Another object of the present invention is to provide an improved parallel holding system that is safer and easier to use on existing machine vises without interfering with a workpiece while it is being machined.

Still another object of the present invention is to provide a parallel holding system that is easily adapted to existing vises and that is effective in holding parallels of various sizes in proper position against the vise jaws.

A still further object of the present invention is to provide a parallel holding system that is easy to manipulate and reasonably inexpensive to manufacture and implement.

Briefly, these and other objects of the present invention are accomplished by an improved clip system for holding parallels in place against the respective jaws of a vise. The clip system comprises a pair of specially configured clip members adapted to releasably engage a retaining plate mounted flush between the jaw and the vise, the retaining plate being formed having a slotted tab extended from either side of the plate for engaging a respective one of the clip members. Each clip member is integrally formed having a hook section inwardly disposed at an intermediate position along its length to engage the slotted tab in a forwardly direction and a cap section inwardly disposed at the forward end of the clip member to clamp flush against the parallel and hold it firmly against the jaw when the hook section is engaged with the slotted tab. The clip members are

1 further formed each having an outwardly disposed leg section intended to
deflect in a forward direction thereby releasing the clip member from
engagement with the retaining plate and allowing removal of the parallel.

5 For a better understanding of these and other aspects of the present
invention, reference should be made to the following detailed description
taken in conjunction with the accompanying drawings in which like
reference numerals and characters designate like parts throughout the figures
thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

For a fuller understanding of the nature and objects of the present invention, references in the detailed description of the preferred embodiment set forth below shall be made to the accompanying drawings in which:

FIG. 1 is a top perspective view of standard machine vise shown in phantom outline and equipped with a clip system for holding parallels in place along the respective jaw of the vise in accordance with the present invention;

FIG. 2 is an exploded view in perspective of the present clip system shown in association with one of the respective vise jaws viewed in FIG. 1;

FIG. 3 is a top plan view of the present clip system assembled in place upon the vise jaw of FIG. 2;

FIG. 4 is a front elevation view of the assembled clip system illustration in FIG 3;

FIG. 5 is a detailed plan view of the clip member used in accordance with the present invention;

FIG. 6 is a cross-sectional view of the assembled clip system taken along the line 6-6 of FIG. 4;

FIG. 7 is a cross-sectional view of the assembled clip system taken along the line 7-7 of FIG. 4; and

FIG. 8 is a forward elevation view taken along the line 8-8 of FIG. 4 illustrating the retaining plate used in accordance with the present invention.

For a better understanding of these and other aspects of the present invention, reference should be made to the following detailed description taken in conjunction with the accompanying drawings.

1 **DESCRIPTION OF THE PREFERRED EMBODIMENT**

Referring now to the drawings and particularly at first to FIG. 1, an improved clip system, generally designated 10, is shown in operating position assembled to the respective jaws 12 of a standard machine vise 14 to retain separate parallels 16 along the opposed surfaces of the jaws. The vise 14, shown in phantom outline, is a conventional tool commonly used to hold a workpiece (not shown) in machines such as drill presses, milling machines and the like having a stationary head 14a and a movable head 14b supported on a base 15. Each of the jaws 12 are attached firmly to the body of the vise 14 and removable from the respective heads 14a and 14b by mean of machine bolts 18 or the like secured through circular openings in the jaw, each opening being respectively aligned with threaded holes formed in the respective heads of the vise. The parallels 16 intended to be held in place by the present clip system 10 are the conventional type of flat, metal plates typically set against the respective jaws 12 on opposite heads 14a, 14b of the vise 14 to mount the workpiece in an exact location or attitude during machining.

Referring now to FIG. 2 in conjunction with FIG. 1, the clip system 10 includes a retaining plate 20 intended to mount flush between jaw 12 and either of the vise heads, the stationary head 14a being shown in FIG. 2 and throughout the remaining drawing figures. The retaining plate 20 is a substantially flat metal plate preferably made of a high grade of tool steel. As best viewed in FIG. 8, the retaining plate 20 is fabricated having essentially the same rectangular profile as the jaw 12 but further formed having a slotted tab 22a, described in greater detail below, extending

transversely from either side of the plate. Each retaining plate 20 is further fabricated having circular openings through the thickness of the plate intended to align with those formed in jaw 12 and vise head 14a so that machine bolts 18 may threadingly engage the vise head and secure the retaining plate firmly between the vise head and the jaw. It is noted and should be understood that the retaining plate 20 is mounted in the aforementioned manner having the slotted tab 20a facing toward the vise head 14a and away from the jaw in order to serve the operation of the clip system 10 in accordance with the present invention.

Referring now to FIGS. 3-7 in conjunction with FIGS. 1 and 2, the clip system 10 further includes a pair of clip members 22 specially configured to engage the slotted tab 20a on either side of the retaining plate 20, thereby clamping the parallel 16 against the face of jaw 12 when assembled to the jaw with the retaining plate mounted between the jaw and vise head 14a. In this assembled state, best viewed in FIGS. 3 and 6, the clip member 22, having a substantially L-shaped cross section, is disposed alongside the assembled jaw 12, retaining plate 20 and vise head 14a to clamp respective edges of parallel 16 in place on either side of the jaw when engaged, as described below, with the slotted tab 20a of the retaining plate.

Referring particularly now to FIG. 5, clip member 22 is substantially rigid in its form yet bendable along its length between a forward cap section 22a and a rearward leg section 22d. The clip member 22 is preferably fabricated, typically by molding, of a plastic material, such as nylon, to provide strength to the clip member for clamping as well as flexibility for its spring-like engagement of the retaining plate 20. As best seen in the profile of FIG. 5, each clip member 22 is integrally formed having cap section 22a

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1 and leg section 22d projecting in opposite directions substantially
perpendicular to the main body of the clip member at the forward and
rearward end thereof, respectively. Cap section 22a is a relatively thin pad-
like appendage at the forward end of the clip member 22 intended to fit flush
5 to the front edge of parallel 16 and clamp it against jaw 12. Leg section 22d
is a relatively thicker appendage projecting from the rearward end of the clip
member 22 opposite from the cap section 22a. Intermediate of the cap
section 22a and leg section 22d, a hook section 22b is formed on the clip
member 22 projecting from the main body in the same direction as the cap
10 section 22a. The hook section 22b is formed along the main body of clip
member 22 a distance rearward and spaced apart from the cap section 22a
that is substantially equal to the aggregate thickness of the assembled
parallel 16, jaw 12 and retaining plate 20. This spacing of the hook section
22b apart from the cap section 22a allows these sections to cooperate in
15 clamping the parallel 16 to the forward face of jaw 12 when the hook section
is engaged in the slotted tab 20a. A flattened section 22c raised in the main
body of clip member 22 between the hook section 22b and leg section 22d
provides a reference surface for contact of the clip member with the side of
vise head 14a and sets the position of the hook section 22c for proper
20 engagement with the slotted tab 20a of the retaining plate 20.

To implement and operate the present clip system 10, therefore, the
retaining plate 20 is initially secured and mounted in place between the jaw
12 and vise heads 14a, 14b on opposite sides of vise 14. When the selected
parallels 16 are ready to be secured to the forward surface of the respective
25 jaws 12, clip member 22 is placed alongside of the respective vise head 14a,
14b assembled together with the jaw and retaining plate 20 with the cap

1 section 22a of the clip member being directed to the forward surface of the
jaw to cover the edge of the parallel thereon. With the parallel 16 in place
against jaw 12 and its edge inserted beneath the inwardly disposed cap
section 22a, the clip member 22 is urged into engagement with retaining
5 plate 20 alongside the respective vise head 14a, 14b with the hook section
22b fitting into and engaging the slotted tab 20a in a forwardly direction and
the flattened section 22c flush against the vise head. The cap section 22a is
thereby urged rearward against the edge of parallel 16 clamping the parallel
flush against the jaw 12 and holding it firmly in place until the clip member
10 22 is released. To release the clip member 22 and remove the associated
parallel 16 from jaw 12, the leg section 22d is deflected in a forward
direction thereby withdrawing the hook section 22b from the slotted tab 20a
and releasing the cap section 22a from the parallel.

Therefore, it is apparent that the disclosed invention provides an
improved clip system for holding parallels properly in place against the jaws
of a vise, particularly more suitable and effective than those parallel holding
devices heretofore developed. The disclosed invention provides an
improved parallel holding system that is safer and easier to use on existing
machine vises and that clamps the parallel in place against the jaw of the
vise without interfering with the positioning of workpiece held within. In
20 addition, the present clip system provides a parallel holder that is easily
adapted to standard machine vises and that is effective in holding parallels of
various sizes in proper position against the vise jaws. Furthermore, the
present invention is easy to manipulate and relatively inexpensive to
25 manufacture and implement on existing vises.

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Obviously, other embodiments and modifications of the present invention will readily come to those of ordinary skill in the art having the benefit of the teachings presented in the foregoing description and drawings. For example, the slotted tab 20a described and shown on one surface of the retaining plate 20 may be alternatively provided on both front and back surfaces of the plate or as a further modification, the tab may be slotted through its thickness to provide engagement with the hook section 22b of clip 22 in accordance with the present invention. It is therefore to be understood that various changes in the details, materials, steps and arrangement of parts, which have been described and illustrated to explain the nature of the invention, may be made by those skilled in the art within the principle and scope of the invention as expressed in the appended Claims.